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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,562	12/14/2001	Mats Larhed	1209-0129P	5761

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EXAMINER

TRAN, MY CHAU T

ART UNIT	PAPER NUMBER
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1639

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/014,562	Applicant(s) LARHED ET AL.	
	Examiner MY-CHAU T TRAN	Art Unit 1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1,3-15 and 17-36 is/are pending in the application.
- 4a) Of the above claim(s) 3,4,10,15,17,19 and 28-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-9,11-14,18,20-27 and 31-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>see Office Action</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Applicant's amendment filed 12/24/03 is acknowledged and entered. Claim 19 has been amended.
2. Claims 2 and 16 have been canceled by the amendment filed on 6/6/03.
3. Claims 1, 3-15, and 17-36 are pending.

Election/Restrictions

4. Applicant's election with traverse of Group I (Claims 1, 5-9, 11-14, 18, 20-27, and 31-36) filed on 12/4/03 is acknowledged.

The traversal is on the ground that Group III (Claims 15, 17, 18, and 35-36) and Group V (Claim 19) should be rejoined with Group I because they all “[s]hare a common technical feature of the reaction using a non-catalyzing solid CO releasing compound of metal carbonyl of formula I”.

This is not found persuasive because first this application is filed under 35 U.S.C. 111(a) **not** under 35 U.S.C. 371. Thus the restriction requirement would fall under the US practice and not the PCT practice wherein “Unity of invention exists only when there is a technical relationship among the claimed inventions involving one or more special technical features”. Second, although these group share the compound (i.e. a non-catalyzing solid CO releasing compound of metal carbonyl of formula I) the invention of each group are distinct (e.g. Group I

claimed a method of performing a one-pot organic reaction, Group III claimed a method of preparing chemical libraries, and Group III claimed a kit) and are *not* coextensive that a search for one invention would *not encompass* the limitations of the other inventions thus resulting in divergent of the evaluations of search and examination. Thus, the search and examination of all three inventions would be burdensome for the reasons as set forth in the previous Office Action (mailed 8/28/03). Third, if applicant believes that the resulting product of the method of Group I and Group III is identical then applicant should state that on record. Therefore, Group III and Group V are not rejoined with Group I.

The requirement is still deemed proper and is therefore made **FINAL**.

5. Claims 3-4, 10, 15, 17, 19, and 28-30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to **nonelected inventions**, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper filed on 12/4/03.

6. Upon further reconsideration, the species restriction is withdrawn.

Information Disclosure Statement

7. The information disclosure statements (IDS) submitted by applicant filed on 3/14/02, 8/30/02, and 6/2/03 are acknowledged and considered.

8. Claims 1, 5-9, 11-14, 18, 20-27, 31-36 are treated on the merit in this Office Action.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1, 5-9, 11-14, 18, 20-27, and 31-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The term “non-metal substrate” of claim 1 is a relative term, which renders the claim indefinite. The term “non-metal substrate” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term “non-metal substrate” would encompass polymer film such as polystyrene, carbon paper, or polymer bead.

b. The term “non-metal substrate compound” of claim 1 is a relative term, which renders the claim indefinite. The term “non-metal substrate compound” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term “non-metal substrate compound” would encompass polymer such as polystyrene, carbon paper, or polymer film.

c. The term “non-metal substrate” and “non-metal substrate compound” as claimed in claim 1 appear to be synonymous with each other and it is unclear if they are two distinct “compound”.

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- d. The phrase "at most 0.5-0.02" is vague and indefinite because it is unclear what is the claimed upper limit (e.g. 0.5 or 0.02).

11. Claim 1 recites the limitation " non-metal substrate " in line 10. There is insufficient antecedent basis for this limitation in the claim 1.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1, 5, 9, 12-13, 18, 24-27, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Corey et al. (*JACS*, 1969, 91(5):1233-1234).

Corey et al. disclose a carboxylation of organic halides via nickel carbonyl in protic acid (pg. 1233, left col., line 38 to right col., line 56). The method comprises the reagents of *trans*-1-bromo-2-phenylethylene (non-metal substrate/ non-metal substrate compound), Ni(CO)₄ (metal carbonyl and catalyst), C₄H₈NH (organic reactant), and the mixture is heated to 60⁰ C (thermal energy source) (pg. 1233, right col., lines 35-54). The nickel carbonyl acts both as a catalyst and a source of carbonyl. The molar ratio of halide and nickel carbonyl is 1:6. Therefore, the method of Corey et al. anticipates the presently claimed method.

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14. Claims 1, 5-9, 12-13, 18, 24-27, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Brunet et al. (*J. Org. Chem.*, **1983**, 48(8):1166-1171).

Brunet et al. disclose several different methods of cobalt carbonyl catalyzed carbonylations of aryl and vinyl halides via sunlamp-irradiated phase-transfer catalysis (Abstract; pg. 1170, right col., line 45 to pg. 1171, left col., line 2; Table I-III). One method comprises the reagents of aryl halide (non-metal substrate/ non-metal substrate compound), $\text{Co}_2(\text{CO})_8$ (metal carbonyl and catalyst), and NaOH (organic reactant), and the mixture is irradiated with a sunlamp (thermal energy source) (pg. 1170, right col., lines 64-66; Table II). The cobalt carbonyl acts both as a catalyst and a source of carbonyl. The molar ratio of halide and cobalt carbonyl is 20:1. Therefore, the method of Brunet et al. anticipates the presently claimed method.

15. Claims 1, 5-9, 11, 13-14, 18, 20-27, and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Zoeller et al. (*Catalysis Today*, **1997**, 36(3):227-241).

Zoeller et al. disclose the method of molybdenum-catalyzed carbonylation of ethylene to propionic acid and anhydride (Abstract; pg. 228, left col., lines 15-48). The method comprises the reagents of ethyl iodide (non-metal substrate/ non-metal substrate compound), $\text{Mo}(\text{CO})_6$ (metal carbonyl and catalyst), and propionic acid (organic reactant) (pg. 228, right col., line 1 to pg. 230, left col., line 10), and the mixture is heated to a temperature of 150-200^o C (thermal energy source) (pg. 228, left col., lines 15-21). The molybdenum carbonyl acts both as a catalyst and a source of carbonyl (Abstract; pg. 239, scheme 1; pg. 240, right col., lines 22-48). Therefore, the method of Zoeller et al. anticipates the presently claimed method.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

18. Claims 1, 5, 7-9, 12-13, 18, 24-27, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunet et al. (*J. Org. Chem.*, **1983**, 48(8):1166-1171) and Lidström et al. (*Tetrahedron*, **11/5/01**, 57(45):9225-9283).

Brunet et al. disclose several different methods of cobalt carbonyl catalyzed carbonylations of aryl and vinyl halides via sunlamp-irradiated phase-transfer catalysis (Abstract; pg. 1170, right col., line 45 to pg. 1171, left col., line 2; Table I-III). One method comprises reagents of aryl halide (non-metal substrate/ non-metal substrate compound), $\text{CO}_2(\text{CO})_8$ (metal carbonyl and catalyst), and NaOH (organic reactant), and the mixture is irradiated with a

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sunlamp (thermal energy source) (pg. 1170, right col., lines 64-66; Table II). The cobalt carbonyl acts both as a catalyst and a source of carbonyl. The molar ratio of halide and cobalt carbonyl is 20:1.

The method of Brunet et al. does not expressly disclose using microwave as an energy source.

Lidström et al. disclose the use of microwave-assisted organic synthesis (pg. 9231, left col., line 56 to pg. 9232, right col., line 14). The microwave-assisted synthesis would provide an advantage of a heating source that is convenient, instantaneous, and very specific (pg. 9232, left col., lines 46-47). Lidström et al. discloses several different organic syntheses that would be benefited by the use of microwave (pg. 9232, right col. Line 20 to pg. 9272).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method by using microwave as an energy source as taught by Lidström et al. in the method of Brunet et al. One of ordinary skill in the art would have been motivated to modify the method by using microwave as an energy source in the method of Brunet et al. for the advantage of providing a heating source that is convenient, instantaneous, and very specific (Lidström: pg. 9232, left col., lines 46-47). Furthermore, one of ordinary skill in the art would have reasonably expectation of success in the method combination of Brunet et al. and Lidström et al. because in both methods the reaction mixture is irradiated by an energy source and the choice of energy source would be a choice of experimental design and is considered within the purview of the cited prior art.

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19. Claims 1, 5-9, 11-14, 18, 20-27, and 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zoeller et al. (*Catalysis Today*, **1997**, 36(3):227-241) and Lidström et al. (*Tetrahedron*, **11/5/01**, 57(45):9225-9283).

Zoeller et al. disclose the method of molybdenum-catalyzed carbonylation of ethylene to propionic acid and anhydride (Abstract; pg. 228, left col., lines 15-48). The method comprises the reagents of ethyl iodide (non-metal substrate/ non-metal substrate compound), Mo(CO)_6 (metal carbonyl and catalyst), and propionic acid (organic reactant) (pg. 228, right col., line 1 to pg. 230, left col., line 10), and the mixture is heated to a temperature of 150-200⁰ C (thermal energy source) (pg. 228, left col., lines 15-21). The molybdenum carbonyl acts both as a catalyst and a source of carbonyl (Abstract; pg. 239, scheme 1; pg. 240, right col., lines 22-48).

The method of Zoeller et al. does not expressly disclose using microwave as an energy source.

Lidström et al. disclose the use of microwave-assisted organic synthesis (pg. 9231, left col., line 56 to pg. 9232, right col., line 14). The microwave-assisted synthesis would provide an advantage of a heating source that is convenient, instantaneous, and very specific (pg. 9232, left col., lines 46-47). Lidström et al. discloses several different organic syntheses that would be benefited by the use of microwave (pg. 9232, right col. Line 20 to pg. 9272).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method by using microwave as an energy source as taught by Lidström et al. in the method of Zoeller et al. One of ordinary skill in the art would have been motivated to modify the method by using microwave as an energy source in the method of Zoeller et al. for the advantage of providing a heating source that is convenient, instantaneous,

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and very specific (Lidström: pg. 9232, left col., lines 46-47). Furthermore, one of ordinary skill in the art would have reasonably expectation of success in the method combination of Zoeller et al. and Lidström et al. because one critical parameter of catalysis is temperature and having a heat source that produces a uniform and consistent heating of the reaction mixture would provide a control of this critical parameter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MY-CHAU T TRAN whose telephone number is 571-272-0810. The examiner can normally be reached on Mon.: 8:00-2:30; Tues.-Thurs.: 7:30-5:00; Fri.: 8:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ANDREW WANG can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mct
March 15, 2004


PADMASHRI PONNALURI
PRIMARY EXAMINER